

## **POLYETHYLENE**

### **Product Summary**

Polyethylene is a clear-to-white, solid, plastic product made by reacting molecules of ethylene gas into long polymer chains in carefully controlled manufacturing processes. Polyethylene is not known to occur naturally. British researchers first synthesized polyethylene in 1933.

NOVA Chemicals' polyethylene products are considered to be safe for humans and the environment in known and intended end uses.

Polyethylene products sold by NOVA Chemicals are identified as NOVAPOL®, SCLAIR® and SURPASS® resins. These products are manufactured in Canada at the Joffre, Alberta site and at the Moore and St. Clair River sites located in St. Clair Township and Corunna, Ontario respectively. These resins are shipped nationally and internationally in bags, bulk cartons, hopper trucks, rail hopper cars and marine containers for use as starting materials in the manufacture of a wide variety of industrial and consumer plastic products.

### **Product Use Information**

Polyethylene resins are used in many product end-use markets, the largest of which is packaging. (Examples of typical end-use applications are listed and are not intended to be fully comprehensive.) They are sold as clear to white, solid pellets or as a granular powder. Polyethylene products are identified as very low, low, linear low, medium, linear medium and high-density resins. Very low-density polyethylene (VLDPE) resins are used in the production of boil-in food packages and heat sealed films and pouches. Low-density polyethylene (LDPE) resins are used in the production of grocery bags, squeezable bottles, and cable insulation. Linear low-density polyethylene ((s)LLDPE), linear medium-density polyethylene ((s)LMDPE) and medium-density polyethylene ((s)MDPE) resins are used in the production of flexible food packaging, shrink-wrap, stretch film and overwrap film. High-density polyethylene ((s)HDPE) resins are used in the production of industrial drums, children's toys, and pressure pipes. The U.S. Food and Drug Administration, Health Canada and other regulatory agencies have determined that plastics and the additives commonly used in plastics are suitable for such applications.

### **Human Exposure**

Due to its use in a variety of consumer products such as packaging, there is exposure of the general public to polyethylene as well as to workers processing the raw pellets into products. Polyethylene has been extensively reviewed by regulatory authorities and determined to be non-hazardous by normal routes of exposure including skin contact, inhalation and ingestion.

Workers producing or processing polyethylene can be exposed to resin dusts when grinding plastics, and to irritating gases while heat processing plastic resins. Workplace air quality measurements made by NOVA Chemicals in typical polyethylene handling and use operations indicate that good equipment design, adequate ventilation, proper handling and personal hygiene procedures minimize these workplace exposures.

The public is exposed to solid polyethylene from everyday use of consumer products made from polyethylene resins. Swallowing small polyethylene plastic items can cause choking. Plastic film products can be an asphyxiation hazard if misused to cover the face.

### **Health Information**

Thorough evaluation of human toxicological data of polyethylene demonstrates that this product poses a low risk under intended use conditions. In workplace processing of polyethylene, contact with fine dusts and heated fumes may cause eye, skin and respiratory system irritation. Contact with hot molten material may cause severe thermal burns, possible permanent injury or blindness. Inhalation of smoke under fire conditions is considered hazardous.

### **Environmental Exposure**

Polyethylene will float on water and can be widely distributed and persistent in land and water systems. Polyethylene will not biodegrade readily in the environment unless it has first been chemically modified by heat or chemical action to reduce the molecular size. This product will slowly change in the presence of sunlight, but will not fully breakdown. Most polyethylene products can be collected and recycled. Waste polyethylene products can also be recovered and used as a high-energy fuel in industrial thermal energy recovery systems. Discarded polyethylene products can be disposed of in public landfills, as they do not break down into hazardous gases or other toxic compounds.

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### Ecological Information

Polyethylene is considered non-toxic in land and water systems. Polyethylene is not readily digestible; pellets may accumulate in the digestive systems of some sea birds and marine life causing possible death by starvation. Pellets do not degrade in soil or in landfill and should be fully recovered from land spills.

### Physical Hazards

Polyethylene is an inert and chemically neutral material. Polyethylene is not considered hazardous and is not regulated in the workplace or in transportation. The product will burn if overheated to high temperatures, and can emit irritating smoke similar to that produced by burning wood. Buildup of fine dust may create an explosive mixture with air. In view of this, precautions should be taken to prevent buildup of static electricity in industrial processing. Spilled product may cause a slipping hazard. Industrial workers should avoid walking on top of deep piles of pellets in storage vessels or in a contained area to avoid risk of falling and possible suffocation.

### Risk Management at NOVA Chemicals

NOVA Chemicals continues to carefully review all relevant information on the safety and suitability of our polyethylene resins for their known and intended end-uses. In addition, our polyethylene resins are constantly being improved and tailored to meet the ever-changing needs of our customers.

NOVA Chemicals is committed to sharing information on the safe handling and end-use of our products with customers and other interested parties. Material Safety Data Sheets (MSDS) are provided to our customers and can be accessed by interested members of the public electronically at the NOVA Chemicals' website at [www.novachemicals.com](http://www.novachemicals.com). Technical information on processing polyethylene resins is also posted on this website.

NOVA Chemicals is a member of the Society of the Plastics Industry (SPI) and the Canadian Plastics Industry Association (CPIA). Through these and other industry associations, we actively monitor and participate in public regulatory processes impacting polyethylene products. We also seek to better understand and support sustainable solutions to plastic recycling and other health and environmental challenges. We actively support industry-sponsored product testing initiatives and other industry initiatives supporting responsible actions, sound science and life cycle stewardship of our products.

*Updated: March 29, 2012*

*For detailed information on this product, please review the product Material Safety Data Sheet (MSDS). In the case of an emergency involving this product, please call our 24-hour hotline at 1-800-561-6682 or 1-403-314-8767.*

*For more information on this product risk profile, please contact us at 1-412-490-4063 or email us at [stewardp@novachem.com](mailto:stewardp@novachem.com).*

*For more information on any NOVA Chemicals' product, please contact us at the nearest location below during business hours or visit our website at [www.novachemicals.com](http://www.novachemicals.com):*

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